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Remarks

Applicants' attorney thanks the Examiner for the Examiner's Interviews March 14, 2006 and April 4, 2006. Applicants amended all claims in accordance with the suggestions of paragraph 7 of the February 7, 2006 Office Action and in accordance with the discussions during the Interviews.

As amended, all claims relate to an ionomer membrane that is without equilibration and has been without equilibration during a manufacturing process. Because support for such amendments are found in paragraph 19, all rejections under 35 USC §112 should be obviated.

The Examiner rejected claims 20, 21, and 24-26 under 35 USC §103 as being obvious unpatentable over EP 1 037 041 A2 ("041 patent") in view of U.S. Patent No. 4,272,353 to Lawrence or U.S. Patent No. 6,319,293 to Debe et al. Based on the foregoing amendments and following remarks, Applicants submit all claims should be allowed.

As stated above, all claims relate to an ionomer membrane that is without equilibration and has been without equilibration during a manufacturing process. All references teach away from such a limitation because all are directed to membranes that have been soaked during manufacturing.

The office action states that the '041 patent never specifies whether the membrane is wet or dry during sensor construction and the office action appears to rely upon the other references to infer a membrane that is dry during the manufacturing process. However, none of the references teach or suggest a dry ionomer membrane where the membrane is without equilibration and has been without equilibration during the manufacturing process.

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Debe discloses a membrane that is wetted during construction. "The MEA [membrane electrode assembly] of this invention can be made...pretrying the ICM [ion conducting membrane] by exposure to a solvent...just prior to attaching the catalyst coated nanostructured acicular support particles." See col. 3, lines 50-60. In all of the examples of Debe's invention, and unless otherwise noted, the membrane was pre-treated prior to attachment of electrode material by exposure to heptane by dipping the membrane in heptane." See col. 23, lines 5-11. Since the membrane was soaked in solution during the membrane electrode assembly, Debe's membrane teaches away from Applicants' dry ionomer membrane that is without equilibration and has been without equilibration during the manufacturing process. Nowhere in Debe does it suggest a membrane without equilibration during the manufacturing process.

Similar to Debe, Lawrence discloses a membrane that is soaked in a solution prior to fabrication with any sensor. The Examiner is correct to point out that the dry membrane is roughened. However, the membrane does not remain dry during the manufacturing process. "Following the preparation of the electrode, that is, the solid polymer electrolyte membrane base member having at least one abraded surface and a finely-divided catalytic material fixed upon the braded surface [this is where the membrane is roughened], the membrane was placed in de-ionized water...and then brought to a boil...The solid polymer electrolyte membrane used in this example and in the following example was a cation polymer membrane wherein the polymer was hydrated ...in de-ionized water." Col. 12, lines 1-50). Since the membrane was boiled and hydrated in water during the manufacturing process, Lawrence teaches away from Applicants' claimed invention. Lawrence does not mention any sensor construction or application of the sensor in between the steps of providing the dry ionomer membrane and soaking the membrane in water. In fact, Lawrence does not mention a sensor or sensor construction anywhere. Nowhere in Lawrence does it suggest a membrane without equilibration during the manufacturing process.

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A prima facie case of obviousness requires that the Examiner show that the proposed combination teaches all of the claimed elements, that there is motivation for the combination, and that there is a reasonable expectation of success for the combination. Because no reference alone or in any combination with one another relates to an ionomer membrane that is without equilibration during the manufacturing process, the proposed combination cannot include the claimed ionomer membrane. When no reference refers to such claimed features, the motivation to combine the stated references in a manner to include Applicant's claimed feature is also absent. The reasonable expectation of success prong is moot given the failure of the "all-elements" and motivation prongs.

Moreover, because all cited references teach away from Applicants' invention, and because there is no disclosure, teaching, or suggestion in any reference to use a membrane that has been without equilibration during the manufacturing process, the combination of the references do not arrive at Applicants' claimed invention without some modification to the combination.


Even assuming that somehow the cited references may be combined, in order for a reference to be properly modified in a rejection under 35 USC §103, there must be some teaching or suggestion to make the modification. Without some teaching or suggestion, one skilled in the art lacks the motivation to make the modification. As discussed above, all of the references not only lack a teaching or suggestion for a dry ionomer membrane during the manufacturing process, but also teach away from Applicants' membrane by disclosing a membrane that is either boiled or dipped in solution during assembly. It can hardly be argued or presumed that Applicants' dry ionomer membrane would be obvious in view of such opposite teachings.

Based on the foregoing, Applicants' submit that all claims are allowable and that all rejections be withdrawn.

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Respectfully submitted,

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